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ness and involved skirmishing and preparation for battle. Today, women cultivate gardens and men do field work. The transition to this situation seems to have been entirely dependent upon the cessation of hostilities and accommodation to reservation living.

Present-day Mapuche agricultural technology varies from the highly conservative hoe-and-dibble cultivation of vegetable gardens and small fields to the fullest utilization of modern farm machinery, and from complete lack of soil conservation to adequate rotation of crops, fields, and the application of fertilizer. Between these extremes are a number of agricultural techniques which, taken as a whole, characterize Mapuche farming operations.

In general, a steel plow is used in the preparation of fields, and ox traction prevails almost to the exclusion of horses. Wooden plows (*astas de cabo*) are occasionally employed, principally along the coast, if the ground is especially full of roots and it is feared that the steel plow may be blunted or its tip broken. If the wooden plow breaks, it can be replaced or repaired fairly easily. The cost of repairing or replacing a steel plow is prohibitive, and breaking the steel point is considered a very great misfortune. The single-share plow is one of the most expensive pieces of equipment owned by the Mapuche.

Oxen are said to be preferred to horses for plowing, and the technique of handling plow horses is not generally known. This also holds for Chilean farmers in the region. It is further maintained that oxen provide more traction than horses and greater durability. It is certain that they require less expensive fodder and less care.

Working about eight hours a day with a single team of oxen and a steel plow, a man needs about three days to plow two hectares of land, which is perhaps all or at least half of the field acreage used by many Mapuche in any one year. Fields often receive a second plowing, rarely a third. If a second plowing is made, the pattern is to make furrows which crosscut each other. This is primarily to break up the clods, rather than to hold rain water. A third plowing is usually diagonal to the first two.

If the second or third plowing takes place in the planting season, the seeds may simply be broadcast before the final plowing, provided the *barbecho* has not been prepared too long in advance and the land has remained fairly soft. Otherwise, the field will be plowed prior to broadcasting the seeds and then harrowed just after the sowing. The triangular-type harrow is the most common one in general use, having either wooden or iron-spike teeth. A heavy log roller (*rodón*) may be

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used to tamp down the fields following the harrowing, but this is now somewhat rare.

Three plowings, widely spaced, followed by seeding and harrowing (and rolling) is the stated ideal to which various accommodations are made. This holds for the coastal, the central, and the Andean zones. The exigencies of weather, along with poor drainage, generally prevent the ideal pattern from being realized.

If a three-field system is adhered to, the initial preparation of *barbecho* may take place in the spring (October-November), when the soil is not too wet, and the second plowing is done in the immediate postharvest season (March), at which time sowing may take place. It is during March, especially, that land is also cleared of stubble and brush by burning. Fires may be seen over the countryside day and night. Sometimes these get out of control, causing damage to buildings and recently harvested crops. Indeed, stacks of chaff (*muelles de paja*) are often set afire purposely, rather than saved, since wheat chaff is considered inferior fodder.

For the most part, preplanting preparations are nearly completed by the middle of April, but because of early rains some planting has to be postponed until there is a temporary break in the weather. According to traditional belief, such a time comes late in June (around St. John's Day), and those farmers who failed to sow before the heavy rains came count heavily on this expectation. To a certain extent, the planting of spring wheat would forestall such a risk, but the practice is generally unknown to the Mapuche.

Wheat is the principal crop on most reservations and is sown in March, April, and May, depending on weather and soil conditions, and harvested in January and February. Oats are grown in a ratio of 1:6 to wheat. They are primarily a cash crop, not being valued as food by the Mapuche, and represent risk capital in a limited sense. If too much rain spoils the oat crop, reducing its commercial value, the harvest is used for winter fodder rather than sold. Oats and wheat, which contain large amounts of wild seeds, such as *arvejilla*, *yuyo*, *rébano*, and chicory, also have little commercial value and are withheld from market.

Some quinoa is grown in small amounts for the home manufacture of *mudai* (a beverage), and oca is raised, at least in the Andean foothills, where it serves as a substitute for potatoes. Melons, squash, and cucumbers, while grown locally, do not figure importantly in the in-

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ventory of *chacarería* on the reservations, but are sometimes raised by Chilean farmers. Within the last few years, some Mapuche near Temuco have begun to grow sunflowers in small amounts wholly for sale. Manure fertilizer is used to enrich the garden crops, but *chacarería* such as peas, beans, and potatoes are not fertilized if grown in large quantity in the fields.

Since 1949 the province has been suffering from a severe potato blight which has literally reduced to near starvation some of the reservation groups living in the coastal zone where potatoes are of great importance and once formed a major part of the diet. Mapuche living in the Central Valley, where wheat is the principal crop, have been less affected. In the Andean region, where the blight seems not to have been as devastating, and where oca is something of a substitute for potatoes, the blight's effects have not been very serious.

Harvesting techniques range from hand-sickle operations to combine harvesting. While the former is practiced by virtually every Mapuche farmer, at least for part of his crops, the latter practice is rarely encountered on the reservations. A combine is used only when provided by a Chilean farmer who is working in half-shares with an Indian. However, ox-drawn harvesters (*epicadoras*) are rather widely used in the Central Valley reservations. They are used primarily for harvesting wheat and are rented to individual Mapuche farmers by *fundo* owners or entrepreneurs who live in the towns. As the harvest operations get under way, harvesters tour the region outlying Temuco and other towns. They are rented for a percentage of the harvest, rather than for cash. Threshing machines are also made available to Mapuche under similar conditions.

There is a pronounced receptivity to "modern" farm machinery among the Mapuche. Although the rented equipment usually clears a field in a few hours at most, which otherwise would have taken an individual family several days to harvest by hand, the rental price seems out of proportion to the labor saved (and is often immediately regretted by the Mapuche), especially in view of the fact that the harvest returns may be as little as 3 or 4:1, as they were in both 1952 and 1953 in many parts of the reservation area. Indeed, returns are sometimes so small that family members scour a harvested field for spikes of wheat untouched by the machine and salvage grain left on the ground after the threshing machine moves to another part of the reservation. On three or four hectares of land, these gleanings may

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amount to a bushel of grain, which is considered sufficient return for the extra work. Had the field been hand-harvested, such loss would have been much reduced.

Hand harvesting is done with sickles. The sheaves are either tied and stacked at intervals or forked into stacks. After the field is cut, the stacks are loaded into oxcarts and either brought home for flailing or animal threshing, or taken to a threshing machine temporarily set up in the vicinity. Some of these manual operations are performed by every Mapuche farmer, even though part of the work may be done by machine. Crops which ripen early or late are often harvested by hand, because the machinery may not be available. Late crops, too, are generally those raised in the poorest, smallest, and most inaccessible fields that have no roads for the passage of large machines. In general, small harvests are reaped by hand and often by an individual family without assistance from neighbors. In the wheat belt of the Central Valley, oats, linseed, and barley are usually harvested in relatively small amounts, representing less than a fifth or sixth of the amount of wheat harvested. *Chacarería* in this zone is generally confined to small plots adjacent to the house, and is hand-harvested – most often by women, who also do the cultivating. In the coastal zone, however, peas and beans are substantial field crops and are often harvested by machine. If the harvest is small, though, they may also be flailed or animal-threshed.

It is difficult to estimate the relative importance of cattle and sheep in the Mapuche system of values. Both are highly esteemed, as much for the prestige involved in owning large herds as for actual commercial value and meat for home consumption. Considering the former aspect, ownership of cattle is perhaps more prestigeful, while owning many sheep assures a marketable product, produced with little care, and a more convenient source of meat for the household.

Sheep are eaten in quantity, but are also highly prized for their wool, which is both sold and used at home for the manufacture of clothing. They are shorn in the spring when their wool is long. At shearing, sheep are dipped in a commercial disinfectant or in a traditional product generally concocted from *canelo* water and other ingredients. The apparatus used for dipping is often no more than a hollow log. Mange is treated with salve and a commercial dip in some cases, but it is quite common for a mixture of *canelo* water and putrid human urine to be applied to the affected parts of the animal.

Oxen are in a class by themselves. They are the only draft animals

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464 only by Mapuche who have very large holdings. The paid crews that
34] work the harvesting and threshing machinery of the Chilean entre-
[248] preneur are composed of both Mapuche and Chileans, who accompany the machines in their slow peregrinations throughout the rural districts surrounding the towns.

243 Mechanization has taken hold in the reservation areas. All the
427 larger and better-equipped *fundos* have harvesting and threshing
[407] machinery for hire and there are harvesters and mobile threshers that make a tour of the countryside wherever the roads permit. As the wheat and oats ripen, the machines are already busy in the more favored parts of the Central Valley. The Mapuche await them as they pass from one reservation to the next, with a feeling of exuberant expectancy. It is common for a man to walk a mile or more to watch the machine harvest the first fields in the vicinity and to examine the thresher carefully even when it is not in operation.

Eventually the harvester reaches one's fields. It is manned by a single operator and drawn by a double yoke of oxen, also owned by
[407] the entrepreneur. Part of the equipment consists of high, cribbed carts, also ox-drawn, which are pulled alongside the harvester to receive the wheat as it is pulled up the conveyer belt.

The Indians themselves provide the animals which draw these carts and they participate in the labor, inasmuch as they guide the carts and pitch the wheat into a huge pile where it stands until thresh-
[476] ing time. This operation is often done on a *vuelta mano* basis, since a single family seldom has sufficient oxen for the work.

[465] The machine operator is not paid by the owner of the crop immediately after his work is done, since payment is made in bags of grain and must await threshing. The family, however, invites him to a meal after his work is finished.

[407] Soon the thresher comes, pulled by a tractor which is later used to power the drive wheel of the machine after it has been set up alongside the stack of wheat. The machine is generally operated by a trained crew of about half a dozen men who are supervised by the owner of the equipment or his representative. None of the local Indians assist with the threshing, there is no *vuelta mano*, and the fam-
[461] ily itself has nothing to do except watch. *Murke* is set out for the
[273] workers to drink while they are engaged in feeding the thresher. After the grain is threshed, the workers and the owner are generally
[262] fed a good meal, possibly goose or pork, and are given a lot of *chicha* or *murke* to drink. After the workers have moved on, the family con-